Contamination sources   Probability of
                                    contamination = Pa + Pb + Pc

```
┌─────────────────────┐          ┌──────────────────────────┐
│                     │          │  Investigators           │
│    Crime scene      │ ───────► │  Scientists              │
│                     │          │  Reagents                │
│                     │          │  Pa                      │
└─────────────────────┘          └──────────────────────────┘
          │
          ▼
┌─────────────────────┐          ┌──────────────────────────┐
│                     │          │  Scientists              │
│       ERU           │ ───────► │  Reagents                │
│                     │          │  Plasticware             │
│                     │          │  Pb                      │
└─────────────────────┘          └──────────────────────────┘
          │
          ▼
┌─────────────────────┐          ┌──────────────────────────┐
│                     │          │  Scientists              │
│     DNA unit        │ ───────► │  Reagents                │
│                     │          │  Plasticware             │
│                     │          │  Pc                      │
└─────────────────────┘          └──────────────────────────┘
```

FIG.   1

FIG. 2

Comparison of peak heights > 0 across all loci,
plotted for negative controls (a population of 26 samples)
and for casework samples (a population of 50 samples). MATLAB.HISTCALC
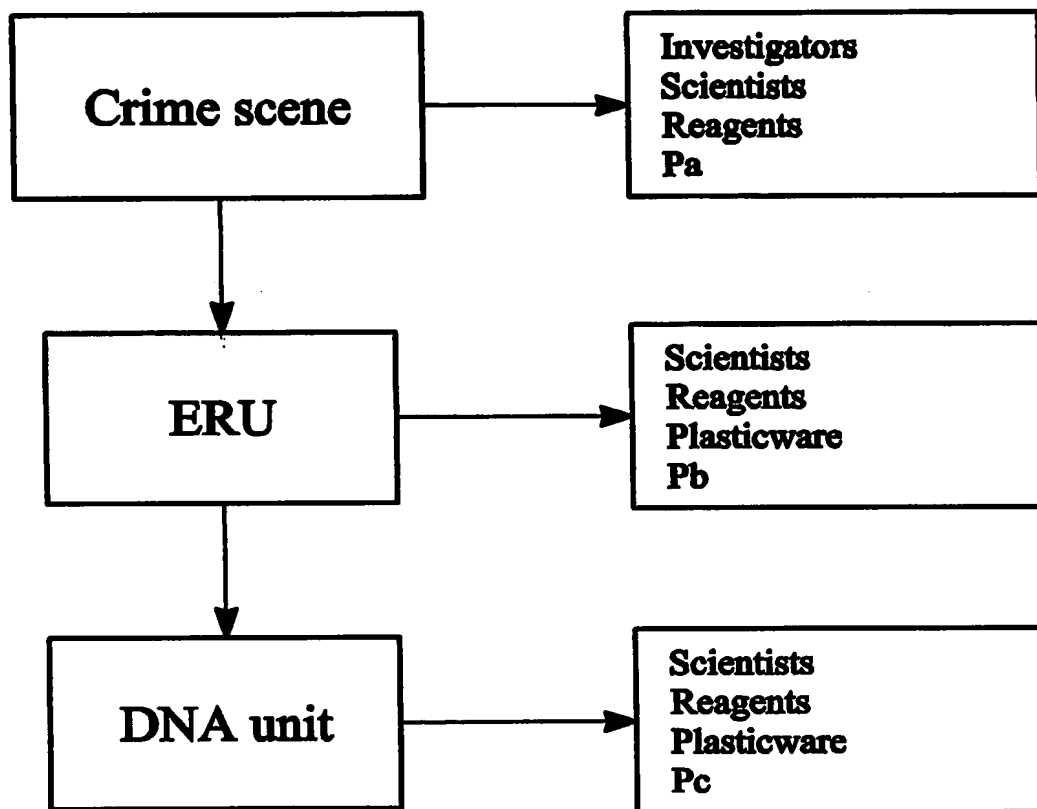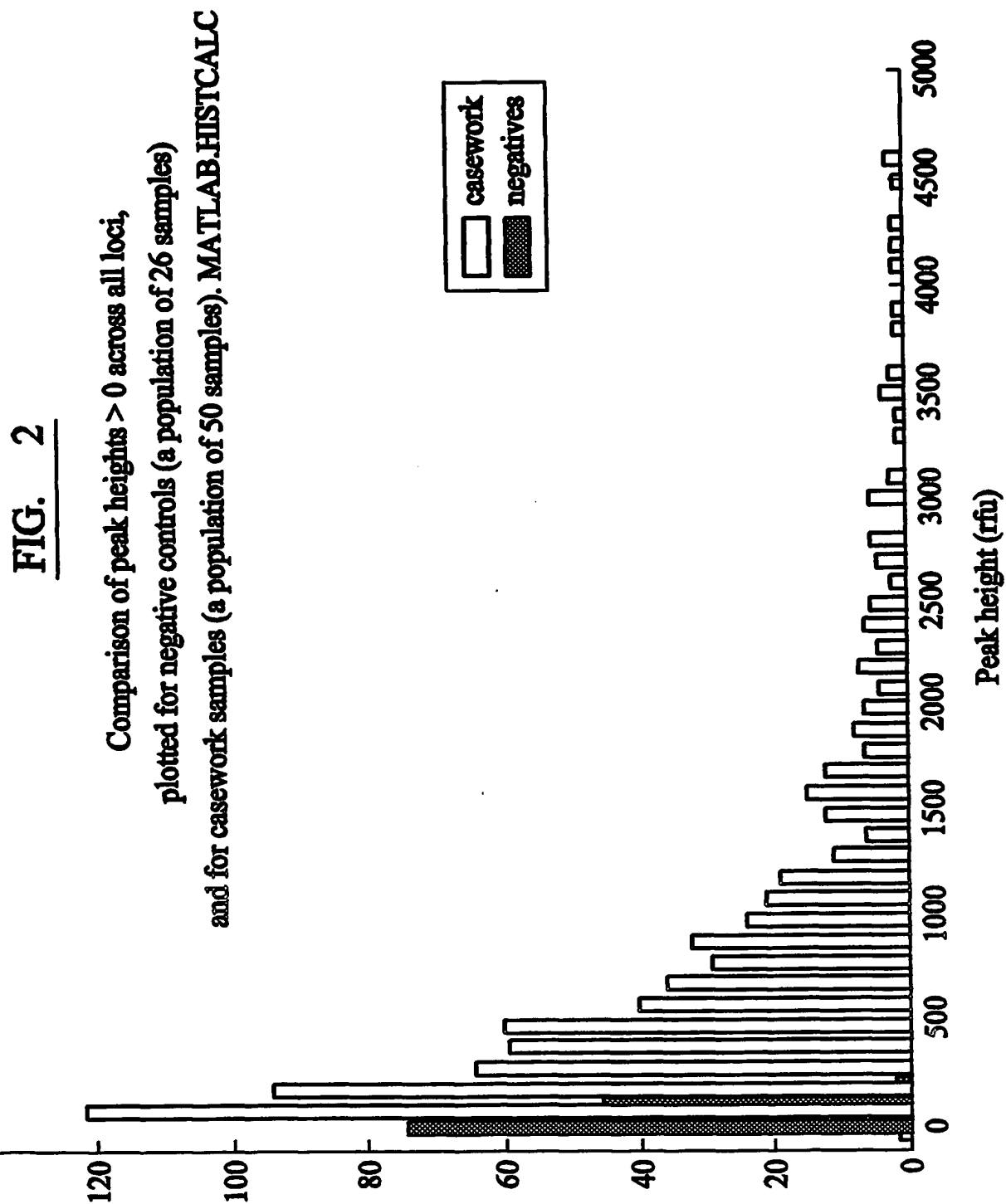
-3/6-

Sum peak height	no. alleles					Sample no.
	>0rfu	>25rfu	>50rfu	>100rfu	>150rfu	
0	0	0	0	0	0	5
0	0	0	0	0	0	10
0	0	0	0	0	0	38
0	0	0	0	0	0	44
0	0	0	0	0	0	49
54	1	1	1	0	0	23
142	2	2	2	0	0	30
424	4	4	4	3	1	29
763	5	5	5	3	3	47
1310	7	7	7	3	3	32
1556	13	13	13	7	2	31
1595	13	13	13	8	4	14
1644	16	16	16	6	3	9
1784	13	13	13	10	5	42
1784	13	13	13	10	5	50
1908	14	14	14	9	7	15
2686	10	10	10	9	9	39
3806	17	17	17	15	14	4
3970	19	19	19	16	14	8
4016	19	19	19	15	12	35
4126	22	22	22	21	19	12
4161	19	19	19	19	19	22
4509	12	12	12	9	8	17
5001	14	14	14	14	14	34
7255	16	16	16	16	16	13
7917	21	21	21	21	21	45
7988	18	18	18	18	18	41
8250	18	18	18	16	16	43
8303	22	22	22	20	19	7
8512	15	15	15	15	15	26
9522	20	20	20	20	20	2
11304	20	20	20	20	20	40
11346	21	21	21	21	21	46
11689	19	19	19	19	19	27
13219	20	20	20	20	20	16
15011	20	20	20	20	20	11
15771	18	18	18	18	18	24
16919	20	20	20	20	20	37
17805	20	20	20	20	19	18
18387	22	22	22	22	22	33
21198	22	22	22	22	22	48
22353	20	20	20	20	20	3
25086	19	19	19	19	19	25
27543	21	21	21	21	21	6
36804	18	18	18	18	18	19
40367	19	19	19	19	19	20
41817	20	20	20	20	20	28
42273	21	21	21	21	21	1
45110	19	19	19	19	19	21
73211	21	21	21	21	21	36

Table 1 : Case samples ranked in order of increasing summed peak height with numbers of allales scored above a given peak height.

FIG.   3

Sum peak height	no. alleles							Sample no.
	>0	>25	>50	>100	>150	>200	>250	
1217	16	16	16	5	3	0	0	26
1109	17	17	9	4	2	2	1	15
695	11	10	6	1	1	1	1	3
481	11	11	3	0	0	0	0	16
413	8	6	2	2	1	0	0	1
334	10	9	0	0	0	0	0	8
290	7	6	2	0	0	0	0	14
242	7	5	1	0	0	0	0	4
234	5	4	3	0	0	0	0	2
226	4	4	2	0	0	0	0	9
140	3	3	1	0	0	0	0	20
104	4	2	0	0	0	0	0	17
67	2	2	0	0	0	0	0	6
64	1	1	1	0	0	0	0	18
60	1	1	1	0	0	0	0	5
51	2	1	0	0	0	0	0	24
50	1	1	0	0	0	0	0	7
50	2	1	0	0	0	0	0	10
50	1	1	0	0	0	0	0	19
46	2	1	0	0	0	0	0	13
36	1	1	0	0	0	0	0	12
36	1	1	0	0	0	0	0	25
33	1	1	0	0	0	0	0	21
33	1	1	0	0	0	0	0	23
31	1	1	0	0	0	0	0	11
16	1	0	0	0	0	0	0	22

FIG. 4

Table 2 : Negative controls ranked in descending order of intensity, taken from a population of 295 negative controls - only 26 controls that gave a signal are listed ie 275 controls were blank.

Mixture (Mx)	No. observations	Probability
Case sample only	12105	0.8207
Negative sample only	130	0.0088
no sample	1345	0.0912
< = .1 > 0	973	0.0660
< = .2 > .1	73	0.0049
< = .3 > .2	30	0.0020
< = .4 > .3	19	0.0013
< = .5 > .4	9	0.0006
< = .6 > .5	9	0.0006
< = .7 > .6	9	0.0006
< = .8 > .7	4	0.0003
< = .9 > .8	6	0.0004
< = 1 > .9	5	0.0003
< = 2 > 1	11	0.0007
< = 10 > 2	19	0.0013
< = 25 > 10	3	0.0002
Total	14750	

FIG.   5

	Guideline (rfu)					
Log10 LR	rfu = 50	rfu = 60	rfu = 70	rfu = 80	rfu = 90	rfu = 100
1	0.00746	0.00502	0.00319	0.00251	0.00339	0.00339
2	0.00217	0.00095	0.00014	0.00088	0	0
3	0.00027	0.00041	0.00210	0	0	0
4	0.00095	0.00183	0	0	0	0
5	0.00014	0	0	0	0	0
6	0.00007	0	0	0	0	0
7	0.00020	0	0	0	0	0
8	0.00088	0	0	0	0	0
9	0	0	0	0	0	0

Table 4: Probability estimates for achieving a given likelihood ratio where a laboratory contaminant is responsible for the major (unmixed) profile.
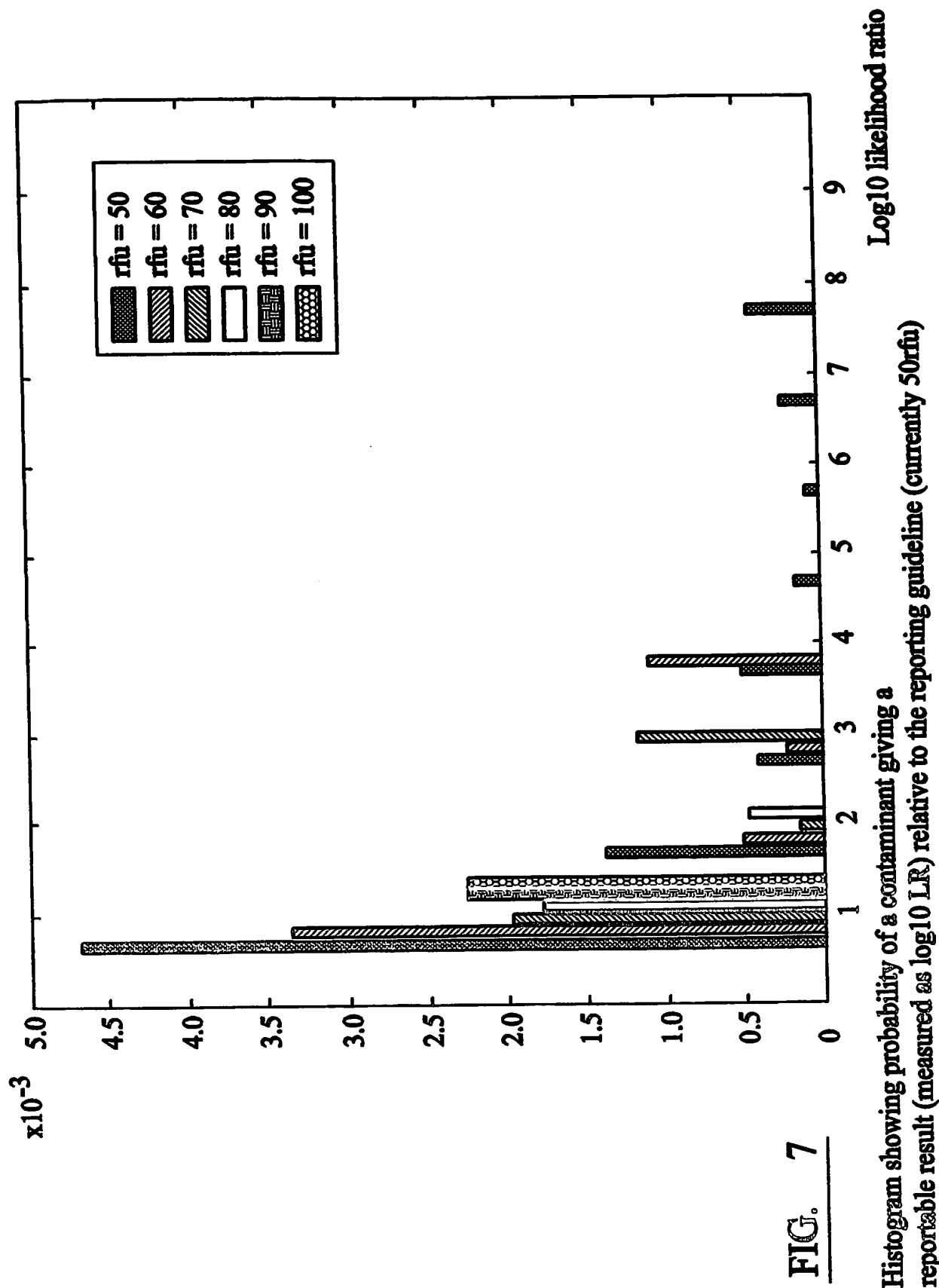
FIG.   6

FIG. 7

Histogram showing probability of a contaminant giving a
reportable result (measured as log10 LR) relative to the reporting guideline (currently 50rfu)